

# Foreign Language Learning Difficulties in Italian Children: Are They Associated With Other Learning Difficulties?

Marcella Ferrari and Paola Palladino

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## Abstract

A group of seventh- and eighth-grade Italian students with low achievement (LA) in learning English as a foreign language (FL) was selected and compared to a group with high achievement (HA) in FL learning. The two groups were matched for age and nonverbal intelligence. Two experiments were conducted to examine the participants' verbal and nonverbal learning skills, such as native language reading accuracy, speed and comprehension, calculation, and attention and self-regulation. Both experiments showed that the LA group seemed at risk for reading comprehension difficulties, but its reading speed and accuracy were within the average range according to Italian norms. The results also excluded the possibility that FL learning difficulties of LA participants could be associated with a deficit in calculation. Furthermore, according to teachers' ratings, children with LA appeared at risk for attention-deficit disorder (ADD). The pattern of learning difficulties of seventh- and eighth-grade participants with LA appeared to be not completely comparable with that of high school students at risk of FL learning difficulties as described in the literature.

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The increasing interest in learning a foreign language (FL) has obliged teachers and clinicians to pay more attention to those students who meet difficulties in learning a foreign language. Contributions have been quite heterogeneous, and a number of theoretical issues have led authors to use different terms to indicate the learning of an FL, such as *second language* and L2. Although we are aware of the theoretical reasons for such distinctions, they are not the focus of the present study. Therefore, these terms will be used interchangeably throughout this article.

Investigations have been carried out to explain the processes that underpin FL acquisition (for a review, see Bernhardt, 2000). Since the 1960s, the research on FL learning has focused on the predictors of success and failure in FL acquisition (Carroll, 1962; Carroll & Sapon, 1959; Pimsleur, Stockwell, & Comrey, 1962; Service, 1992; Skehan, 1986, 1989; Sparks & Ganschow, 1991;

Sparks, Ganschow, & Patton, 1995; Sparks et al., 1997). In the study known as the Bristol Language Project, Skehan (1986) highlighted the relevance of a child's aptitude in the acquisition of a second language. Skehan noticed that the progress rate in the acquisition of a second language was highly correlated with aptitude tests. Further evidence was obtained with adults engaged in intensive study of a foreign language. Their cognitive aptitude showed a stronger correlation with speaking and reading proficiency in FL than any other variable (e.g., learning style, personality, and affective parameters; Ehrman & Oxford, 1995).

A series of prediction studies (Dufva & Voeten, 1999; Service, 1992; Service & Kohonen, 1995) revealed that native language (L1) phonological-orthographic skills and phonological memory, together with the ability to compare L1 syntactic-semantic structures, predict foreign language learning in young students. Sparks et al.

(1995) indicated that FL aptitude and native language spelling were the best predictors of FL grade, whereas Sparks et al. (1997) found that FL grade and FL word recognition were predictive of FL oral and written proficiency in high school students. Further studies provided support in favor of the hypothesis that academic proficiency in a student's first language was predictive of success in FL learning (Humes-Bartlo, 1989; Olshtain, Shohamy, Kemp, & Chatow, 1990). It is worth noting that a large body of studies has demonstrated the crucial role of verbal memory in FL learning (see, e.g., Baddeley, Gathercole, & Papagno, 1998; Cheung, 1996; Gathercole, Hitch, Service, & Martin, 1997; Masoura & Gathercole, 1999; Miyake & Friedman, 1998; Palladino & Cornoldi, 2004; Service, Simola, Metsänheimo, & Maury, 2002; Thorn & Gathercole, 1999). Also, phonological awareness has been shown to be strongly related to FL learning (e.g., Comeau, Cormier, Grandmaison, &

Lacroix, 1999; Hu, 2003). Although research on memory variables has consistently demonstrated their role in L1 and L2 learning and learning difficulties, it will not be further reviewed in the present article, as it falls outside the specific subject of the current study.

Several studies conducted by Ganschow, Sparks, and their colleagues have examined affective and cognitive variables and their influences on FL learning, on the hypothesis that affective factors (e.g., anxiety, motivation) are less relevant than cognitive variables, and verbal skills are predominant, compared to nonverbal skills, in their relationship with second language learning. These authors compared students identified as successful or unsuccessful FL learners, with the aim of determining whether they differed in native language and FL aptitudes as well as cognitive and academic skills.

In a critical study, Sparks, Ganschow, Javorsky, Pohlman, and Patton (1992a) focused on the identification of native language deficits in two groups of low-risk (LR) and high-risk (HR) FL learners in high school. Participants attending the first year of high school were selected according to the *Foreign Language Screening Instrument for High School* (FLSI-H), a self-report about the academic, developmental, and FL learning history of each student. LR students (mean age 15 years 5 months) were strong FL learners according to their teachers' evaluation (with an A or B mark during the first quarter) and scored low risk on the FLSI-H. The HR students (mean age 15 years 7 months) were selected as weak FL learners according to their teachers' evaluation (a D or F mark in the first quarter) and scored high risk on the FLSI-H. Participants were tested on measures of both native language and FL aptitude skills. Measures of native language skills assessing phonological (i.e., spelling, word identification, pseudoword reading, auditory perception, and conceptualization of speech sounds), syntactic (e.g., knowledge and use of punctuation and capitalization, orthography), and semantic skills (i.e.,

passage comprehension, vocabulary knowledge) were administered. The *Modern Language Aptitude Test* (MLAT; Carroll & Sapon, 1959) was presented to measure FL aptitude, with subtests of phonology, syntax, and semantics.

Sparks et al. (1992a) found significant differences between groups on the FL aptitude test, as LR students showed higher performances than HR students. LR students performed better also on native language measures. A comparison of measures of native language skills revealed significant differences between groups on phonology and syntax. No significant differences were found on measures of semantics. Sparks et al. concluded that together with their FL problems, HR FL learners also exhibited subtle native language learning difficulties, which seemed to be more evident in the phonological and syntactic codes but not at the semantic level. Such phonological and syntactic problems seemed to be difficult to detect, considering also the important fact that none of the HR students had been identified as having learning disabilities (LD). HR students, indeed, showed problems in FL learning despite their overall average performance on scholastic achievement.

When high school students identified as having HR and LR for FL learning difficulties (Sparks, Ganschow, Javorsky, Pohlman, & Patton, 1992b) were compared with a group of students with LD in FL learning, no differences were found between the native language skills and the FL aptitude of HR and LD students (for similar results, see also Sparks, Artzer, Javorsky, et al., 1998). These results suggest that difficulties in phonological and syntactic processing could be crucial to FL learning, whereas semantic abilities, which appeared comparable among groups, may be less relevant in differentiating between levels of FL learning. However, taken together, the results of the studies just described seem a bit confusing: On the one hand, they appear to highlight the absence of previous LD in high-risk

students (Sparks et al., 1992a), but on the other hand, they seem to point out that students identified as being at risk for FL learning difficulties are rather comparable in their phonological and syntactic problems to students with LD (Sparks et al., 1992b). A potential answer to this inconsistency could come from factors related to the students' age, which will be discussed later in this article. Another possible answer could derive from the analysis of high-risk FL learning students' profiles. A study of five prototypical profiles of students with difficulties in FL learning, each showing a different language performance along the dimension of the phonological, syntactic, and semantic codes (Sparks & Ganschow, 1993a, 1993b), introduced the concept of the "garden path" in the field of FL learning difficulties. Beside FL learning, the following skills were examined: (a) level of general intelligence, assessed with the *Wechsler Intelligence Scale for Children-Revised* (Orsini, 1993); (b) phonological skills, assessed with spelling, dictation, and word identification tests; (c) syntactic skills, assessed with writing, text correction, and punctuation tests; and (d) semantic skills, assessed with oral and written comprehension, vocabulary, and synonyms and opposite knowledge tests. The most frequent FL learning difficulty profile that emerged among college students is again consistent with evidence from previously presented studies: a profile of low phonological and syntactic skills but average semantic abilities (Sparks & Ganschow, 1993a).

In summary, the studies reviewed here have consistently indicated that native language phonological and syntactic skills, but not semantic skills, are closely related to FL learning (e.g., Ganschow & Sparks, 1993; Sparks, Artzer, Ganschow, et al., 1998; Sparks & Ganschow, 1993a, 1993b; Sparks et al., 1992a). Such findings support the *linguistic coding differences hypothesis* (LCDH; Sparks & Ganschow, 1991, 1993b; Sparks, Ganschow, & Pohlman, 1989), which suggests that difficulties in phonological-orthographic and syn-

tactic abilities in the native language could have negative effects on FL learning. In other words, students who have FL learning problems would likely have experienced difficulties with native language learning, particularly in the phonological-orthographic (sound and sound-symbol) and syntactic (grammatical) components of language learning.

Research has focused also on the relationship between reading skill and second language learning, providing evidence supporting the LCDH. For example, Meschyan and Hernandez (2002) examined native language decoding skills and their relationship to FL proficiency. Their results showed that native language decoding skills predicted second language proficiency in college-age students. The relationship was mediated by the participants' ability to decode FL words. Similar results were obtained by Koda (1992), who found that word recognition was significantly related to FL proficiency and also that variations in L1 reading experience may induce a strong preference for particular processing procedures in L2 reading (Koda, 1996).

The comparison between reading comprehension in the L1 and FL seems to indicate that there are multiple similarities between the skills needed to comprehend both languages (Bernhardt, 2000; Weber, 1991). FL reading comprehension skills overlap in several respects with native language reading comprehension skills, in that both are sensitive to the same variables, such as background knowledge, vocabulary knowledge, verbal working memory, strategy knowledge, and metacognition (see, e.g., Miyake & Friedman, 1998, and for a review, Bernhardt, 2000). However, most of these studies have been conducted with highly educated young adults, mainly college or undergraduate students. Therefore, native language learning measures mainly represent the adults' skills that may result from years of practice and strategy development.

In fact, at this point of an academic career (high school, college, etc.)

it is rather difficult to reconstruct the students' native language learning difficulties, as students with such problems may have dropped out of school or may have partly controlled for their problems with complex compensating strategies. Research with young adults has the limitation of not allowing for a direct analysis of the developmental and academic history of students with FL learning difficulties. It is, in fact, possible to obtain only a self-report evaluation or information related to their scholastic career in order to examine how their lower phonological and syntactical abilities could have influenced their learning and scholastic achievement in both verbal and non-verbal areas. An examination of these variables could be possible when children start to learn a FL, as soon as they reach a certain proficiency in the early school years. Therefore, it could be crucial to examine the FL learning difficulties of children in countries where FL is taught from the first few years of school. This is the case of the Italian school system, where students start to learn English in primary school, thus allowing researchers to identify early FL learning difficulties in a consistent and reliable manner (see Palladino & Cornoldi, 2004). Italian students are exposed to an FL (English in the majority of cases) when they are preschoolers, and by the seventh and eighth grades—when they are 12 and 13 years old—they are expected to know at least some FL grammar and syntax and a certain amount of vocabulary and phonology. Given that FL learning starts at such a young age, it is possible to consistently and reliably identify cases of specific difficulty in FL learning (see Palladino & Cornoldi, 2004).

### Purpose of the Study

The general purpose of this study was to investigate the LCDH (Sparks et al., 1989) in seventh- and eighth-grade Italian students identified as either low-achieving (LA) or high-achieving (HA) FL learners, who were learning

English as a second language, to extend Sparks et al.'s (1989) hypothesis to different languages and to an early age. Previous studies have suggested that high school and college students showing difficulties in learning a foreign language consistently exhibit minor difficulties in phonological and syntactic coding, although an assessment of their learning skills may exclude a severe learning disability both in reading and language comprehension (e.g., Sparks et al., 1992a, 1992b; Sparks, Artzer, Ganschow, et al., 1998). Furthermore, a number of studies have reported cases of comorbidity of attention-deficit/hyperactivity disorder (ADHD) and other language problems (e.g., Carte, Nigg, & Hinshaw, 1996; Elbert, 1993; Gilger, Pennington, & DeFries, 1992) or other developmental disorders (Dewey, Wilson, Crawford, & Kaplan, 2000; Kaplan, Crawford, Wilson, & Dewey, 2000). Recent research investigating the cognitive differences among groups of children with characteristics of reading disabilities (RD), ADHD, or both showed that poor readers, whether suffering from RD or ADHD symptoms, shared a generalized deficit in phonological processing (Swanson, Mink, & Bocian, 1999). In contrast, a few studies that examined the FL proficiency of students with ADHD with or without LD revealed only a few associations between the disorder and a difficulty in FL learning (see, e.g., Sparks, Javorsky, & Philips, 2004, 2005; Sparks, Philips, & Javorsky, 2003).

To our knowledge, no evidence has been collected regarding the calculation skills of students with FL learning difficulties, although poor phonological and decoding skills could be associated with poor calculation ability (such as in children with dyslexia; see, e.g., Geary, 1993, 2004; Geary, Hoard, & Hamson, 1999; Jordan, Hanich, & Kaplan, 2003). However, in the literature on LD, comorbidity between different disorders is rather common, and it would be expected with a difficulty in FL learning, which shares low-level linguistic processing with many differ-

ent learning skills (see, e.g., Bishop & Snowling, 2004; Geary, 1993; Geary et al., 1999). Therefore, it is possible that the absence of evidence for such an association is due to the fact that until now, FL learning difficulty has been investigated mainly with senior students and within the linguistic area. Our study compared two groups of LA and HA FL learning students on measures of native language skills (Experiments 1 and 2) and on calculation skills and teachers' evaluation of their attention and self-regulation behavior (Experiment 2) to clarify the nature of FL learning in terms of comorbidity with other learning difficulties together with the role of age and school level.

In two experiments the following research design was implemented: a group of students showing low achievement (LA) in learning English as an FL, but with adequate nonverbal intelligence, was selected from a wide sample of seventh- and eighth-grade students and compared to a group with high achievement (HA) in FL learning, again selected from the same initial sample, who were matched for nonverbal intelligence, age, and gender but showed above-average FL learning. The research design is based on the comparison between two matched groups who differ only on one critical learning variable (i.e., FL learning proficiency), thus allowing significant differences in the dependent variables between groups to be directly related to FL learning. Both experiments tested group differences with statistical comparisons in order to highlight even slight but significant effects between groups. Furthermore, both experiments were aimed at drawing attention to the distinction between a low yet average performance and a low and at-risk learning performance according to norms reported by standardized measures.

Experiment 1 investigated native language reading comprehension and reading accuracy and speed with the aim of detecting whether children who have FL learning difficulties might also show low efficiency on L1 reading

comprehension, speed, and accuracy. The LCDH suggests that students with FL learning difficulties have less efficient decoding skills than reading comprehension skills because their learning problem seems to be mainly due to poor phonological-orthographic processing (e.g., Ganschow, Sparks, & Javorsky, 1998; Sparks et al., 1989; Sparks & Ganschow, 1991, 1993a).

To obtain further support and replicate these findings, Experiment 2 was conducted. The results of Experiment 1 required confirmation, as they were not completely consistent with evidence obtained in previous studies: They showed a rather significant difficulty in the semantic area (reading comprehension) in students with LA in FL. Thus, Experiment 2 was developed to further explore the learning skills of participants with FL learning difficulties also in fields less related to language learning, such as calculation abilities and the ability to control attention and to self-regulate behavior.

## EXPERIMENT 1

### Method

#### *Participants*

One hundred and fifty two students (71 seventh graders and 81 eighth graders) with a mean age of 13.25 years ( $SD = 4.52$  months) attending a public junior high school in Pavia, Italy, participated in the first selection stage of this study. They had started to learn English as an FL in second grade, receiving 2 hours of formal English teaching per week. All participants had a typical educational career and regularly attended school. Students with severe LD that would prevent them from completing standardized tests were excluded from the initial sample of 152 students. Non-native Italian speakers were also excluded, as they were learning Italian as an FL together with English. To select groups with low achievement (LA) and high achievement (HA) in FL learning, a battery of FL learning tests, the *English*

*Learning Task* (ELT; Palladino & Cornoldi, 2004), was presented collectively to each class during school days. The ELT included an English dictation task of 30 unrelated concrete words (15 disyllabic and 15 trisyllabic) and 24 multiple choice questions on English grammar and syntactic rules based on expected school achievement according to grade. The dictation task allowed the evaluation of writing skills and, in particular, orthographic skills and grapheme-phoneme correspondence. The dictation text was tape-recorded and presented at a pace of about one disyllabic word every 4 seconds and one trisyllabic word every 6 seconds. Dictation lasted about 10 minutes, including the first few minutes of instructions. Participants were then requested to complete the multiple choice test. This task required a correct acknowledgment of the grammar rules concerning tenses, forms, and singular/plural forms of nouns. The same task involved different syntactic rules as well (subject-verb correspondence; knowledge and usage of affirmative, negative, and interrogative forms of the sentence).

The Spatial Reasoning subtest from the *Primary Mental Aptitude Battery* (PMA; Csonka, 1976; Thurstone & Thurstone, 1963/1981) was administered to yield a measure of nonverbal intelligence. Collective administration of the PMA subtest and ELT required about 20 minutes during school hours. On the basis of these test scores, two groups of students were identified: those with low achievement (LA) in FL learning and those with high achievement (HA). The selection criteria were similar to those used by Palladino and Cornoldi (2004), as follows:

*LA group:* a score lower than the 20th percentile on the ELT, but a score equal to or higher than the 50th percentile on the PMA Spatial Reasoning subtest; and

*HA group:* a score equal to or higher than the 50th percentile on both the ELT and the PMA Spatial Reasoning subtest.



From the initial sample of 152 students, 16 participants (8 seventh-grade and 8 eighth-grade students; 6 boys and 10 girls) showed scores compatible with the LA group selection criteria. They were matched for age, sex, grade, and level of nonverbal intelligence with as many students (16 students, 6 boys and 10 girls) who met the HA selection criteria, again selected from the initial sample.

To verify the external validity of the groups' selection, FL teachers were asked to evaluate each student's FL grammatical learning, listening comprehension, speaking and writing skills, and global learning, on a scale from 1 (*no difficulty*) to 4 (*great difficulty*). Groups differed significantly on all the teachers' evaluation indices in the expected direction,  $t(30) = 7.82, p < .001$ ;  $t(30) = 6.4, p < .001$ ;  $t(30) = 9.18, p < .001$ ; and  $t(30) = 7.94, p < .001$ , respectively. The groups' mean scores on the selection tests and teachers' evaluations are shown in Table 1. Table 2 shows the frequency of students obtaining each of the FL teachers' evaluation scores (from 1 to 4).

## Materials and Procedure

**Reading Skills.** Native language reading skills were tested with an Italian standardized battery of reading

tests that measured (a) reading comprehension and (b) reading accuracy and speed (Cornoldi, Colpo, & Gruppo MT, 1995). The norms available can place a student's score within a range of performance levels and distinguish between two levels of poor performance (negative performance suggests the need for extra attention to the students' performance or, in some cases, immediate intervention) and two levels of competence (positive performance indicates that the criterion is sufficient or satisfied).

### Reading Comprehension Test.

The reading comprehension task was composed of two passages for each grade—a narrative one and a science-based one, selected according to the student's grade. Each passage is followed by a series of multiple choice questions. Seventh-grade students were asked to answer a total of 22 questions (12 questions for the narrative text and 10 for the science-based one) and eighth-grade students a total of 35 questions (15 questions for the narrative text and 10 for the science-based one). Questions are all inferential, and the passage is kept available to the reader throughout the test. This procedure was adopted so that the correct answer would not simply result from memory of the passage or from a

correct identification of the critical information contained in the passage, but would be the product of an inferential process leading to adequate comprehension.

The participants' task was to silently read each passage and answer the questions. One point was given for each correct answer. The maximum time allowed for participants to complete the task was set at 20 to 30 min according to the test's norms. Validity indices obtained in test standardization, intended as the correlations between the two parallel forms at each grade, were  $r = .50$  and  $r = .44$  for seventh and eighth grade, respectively. Reliability indices, computed as the correlation between item and total score, were between  $r = .31$  and  $r = .54$ .

### Reading Accuracy and Speed.

This task includes two tables, one for the participant (reading proficiency table) and one for the examiner (answer table). The reading proficiency table contains a short text, different according to the students' grade, which is presented to the participant. After reading the title out loud, the examiner asked the participant to read the whole passage aloud as fast and accurately as possible. The examiner was trained to record the reading accuracy on an error score sheet and, with a stopwatch, to keep track of the total reading time in seconds. Participant's reading performance was audiotape-recorded for a subsequent check, which was done mainly for more incorrect performances.

The errors were then evaluated as more or less severe (with a score of 1 or 0.5, respectively) according to standard instructions. The following errors were considered more severe: inaccurate syllable reading; syllable, word, or line omission; syllable or letter addition; rereading of the same line; and a break of more than 5 seconds. A stress shift, hesitation, and self-correction after a severe error were considered less severe and scored accordingly. An example of error might consist of reading "*ogni individuo appartenente alle specie*

**TABLE 1**  
Experiment 1: Mean Scores and Standard Deviations on Selection Tests and Teacher Evaluations, by Group

Test/Evaluation	LA		HA	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Selection				
PMA Spatial Reasoning	36.90	6.30	37.88	5.80
ELT	20.00	6.31	43.00	5.42
Teacher's evaluation				
FL grammatical learning	3.70	0.48	2.06	0.68
Listening comprehension and speaking	3.63	0.71	1.94	0.77
Writing skill	3.88	0.34	1.94	0.77
Global FL learning	3.81	0.54	1.94	0.77

Note. PMA = *Primary Mental Aptitude Battery* (Csonka, 1976; Thurstone & Thurstone, 1963/1981); ELT = *English Learning Task* (Palladino & Cornoldi, 2004); LA = low-achieving foreign language learners; HA = high-achieving foreign language learners; FL = foreign language (English).

*superiori*" (each individual belonging to superior species) as "*ogni individuo appartiene alle specie superiori*" (each individual belongs to superior species).

The reading tasks were administered to students during individual testing sessions. The reading comprehension task lasted about 30 min, and the reading accuracy and speed tasks lasted on average 2 to 3 min. Each test was timed for all participants. Reading comprehension and reading accuracy and speed tasks are standardized measures, showing validity indices around .90 as the correlation between the two parallel forms for each grade.

### Data Analyses

Statistical comparisons have been conducted to test differences between groups together with a comparison with clinical classifications obtained from Italian norms. To test the differences in reading skills (reading accuracy, speed, comprehension) between groups, a multivariate analysis of variance (MANOVA) was carried out on reading speed and accuracy scores and comprehension scores. Statistics are reported for each single measure under separate headings in the following sections. To compare group scores with standard norms, each performance was referred to classification criteria of the reading test battery (Cornoldi et al., 1995) to distinguish between a poor and a positive performance.

## Results

### Reading Accuracy and Speed

Table 3 shows the groups' means and standard deviations on reading proficiency scores. The LA FL learners were significantly less accurate than the HA FL learners on the reading accuracy measure,  $F(1, 30) = 4.3, p < .05, \eta^2 = .12$ . In reading the passage, the HA FL learners on average made only one severe error ( $M = 1.0, SD = 1.5$ ) or two less severe errors, whereas the LA FL learners made more than three errors ( $M = 3.5, SD = 2.0$ ).

Among the variety of reading accuracy errors, the most common was the inaccurate syllable reading, considered a severe error (scoring 1 for each error). However, the reading speed performance, which in a transparent language such as Italian is considered to be the best index of decoding skill (see, e.g., Wimmer, 1993), did not differ among groups. Both groups read the passage on average in approximately 2 min at a rate of about 4.5 syllables per second for the control group, and 4 syllables per second for the LA FL learners,  $F(1, 30) < 1, \eta^2 = .06$ . A closer look at the mean score performances (see Table 3) allowed us to classify participants according to Italian norms; for both indices, the classification suggested an average performance within the positive range (a score equal to or lower than 147.78 on reading speeds is considered positive, as is a score equal to or lower than 8 on reading accuracy).

### Comprehension

A significant difference between groups was found on the reading comprehension measure for both passages, the narrative,  $F(1, 30) = 8.78, p < .01, \eta^2 = .22$ , and the science-based one,  $F(1, 30) = 13.05, p < .001, \eta^2 = .30$ . As can be seen in Table 3, reading compre-

hension appeared rather low in LA FL learners, with an average of 50% or more incorrect answers. Furthermore, the average reading comprehension score of the LA group was, for both texts, at an "at-risk" classification level according to Italian norms (a score equal or lower than 10 is considered at risk).

Figure 1 shows the classification of the participants' performances in different categories according to Italian norms. As can be seen from Figure 1, a low number of LA FL learners showed a positive performance; more than half of them could be considered at risk for a reading comprehension disability.

When the reading comprehension scores for the narrative text were clas-

**TABLE 2**  
Experiment 1: Frequency of Teachers' Evaluation Scores on Global Foreign Language Learning Scale

Global FL leaning score	LA	HA
No difficulty	0	5
Little difficulty	1	7
Some difficulty	1	4
Great difficulty	14	0

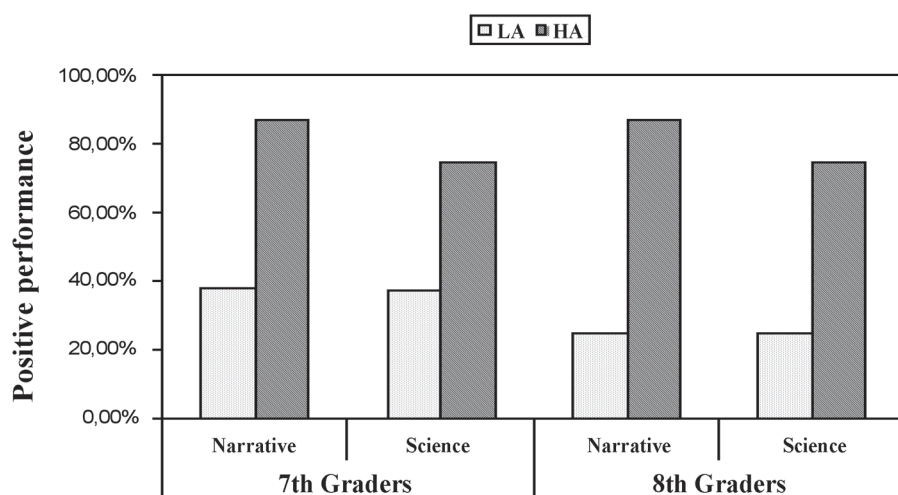
Note. LA = low-achieving foreign language learners; HA = high-achieving foreign language learners; FL = foreign language (English).

**TABLE 3**  
Experiment 1: Mean Scores and Standard Deviations on Selection Tests and Teacher Evaluations by Group

AL-MT reading skill	LA		HA	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Reading accuracy <sup>a</sup>	3.5	2.06	1.0	1.5
Reading speed <sup>b</sup>	143.50	35.26	127.81	28.04
Reading comprehension				
Narrative	5.53	2.78	8.37	2.82
Science based	5.50	2.60	8.25	1.57

Note. LA = low-achieving foreign language learners; HA = high-achieving foreign language learners; AL-MT = *La Verifica dell'Apprendimento della Lettura: Nuove Prove Oggettive MT di Lettura* [Reading Learning Skill Test: New Reading Objective Tasks for Reading Testing] (Cornoldi, Colpo, & Gruppo MT, 1995).

<sup>a</sup>Number of reading errors. <sup>b</sup>Reading time in seconds.



**FIGURE 1.** Experiment 1: Percentages of positive performance on reading comprehension tasks by group, grade, and comprehension task. LA = low-achieving foreign language learners; HA = high-achieving foreign language learners.

sified, we observed that a high percentage of HA participants were placed in the positive competence range (85.7% of both seventh and eighth graders), whereas the percentage of LA FL learners who obtained a positive performance was much lower (38% of seventh graders and 25% of eighth graders). Similar results were obtained with the science-based text: A high percentage of HA FL learners were placed in the positive competence range (75% of both seventh and eighth graders), whereas the percentage of LA participants who obtained a positive performance was much lower (37.5% of seventh graders and 25% of eighth graders).

## Discussion

The results showed that participants selected as LA FL learners seemed less efficient in native language reading skills, but their profile was not completely homogeneous across reading speed, accuracy, and comprehension. In fact, seventh- and eighth-grade Italian LA FL learners appeared comparable with HA FL learners in reading speed when a passage was presented. LA participants also scored within the average range expected for their age

and educational level in reading accuracy. However, they performed very low on both the reading comprehension tests, showing an average score that was not only significantly lower than that of the HA group, but that according to standard norms, was negative in the majority of cases, indicating that they were at risk for a reading comprehension learning difficulty.

Taken together, these results showed that LA FL learning students show adequate reading speed and decoding skills as measured with a passage reading test but poor comprehension of both narrative and science-based texts. A possible explanation of the lack of difference between groups in reading speed could be that the reading speed and accuracy of LA FL learners was aided by the context in which the words appeared. However, it should be noted that LA participants scored lower than HA students in reading comprehension and, thus, were likely to be less able to take advantage of context to improve reading accuracy skills.

It is also worth noting that LA participants showed a pattern of performance in reading tasks that is not completely consistent with that observed in older participants at risk for

FL learning difficulties. Sparks et al. (1992a) showed that high-risk FL learners are less efficient in tasks requiring phonological and orthographic skills compared to semantic skills. This result has been replicated in a number of studies (see, e.g., Sparks et al., 1992b; Sparks & Ganschow, 1993b). One possible explanation for the differences between the present results and those reported in the literature is related to the higher educational level of the young adults in Sparks et al.'s studies. Students who are a few years older than our seventh- and eighth-grade participants are likely to have a greater learning experience, superior text knowledge, and more mature strategic approaches to counter possible weaknesses in low-level processing. Furthermore, a selection bias may also contribute to explaining the difference, because students with greater difficulties may simply drop out of school and thus rarely reach higher educational levels. They are, however, included in our sample of seventh- and eighth-graders, as these are the last compulsory educational grades in the Italian educational system.

A second experiment was thus conducted to replicate the findings from Experiment 1 and to further clarify the relationship between FL learning difficulties and native language skills in seventh- and eighth-grade Italian students. The results of the first experiment, when statistically significant ( $p < .05$ ), showed rather high effect sizes ( $\eta^2 > .20$ ), except for reading accuracy and speed, probably due to the small difference between each group's means.

Moreover, the nature of FL learning difficulties was investigated by extending the examination to calculation skills. Based on the idea that calculation skills share basic processing with phonological analysis (see Geary, 2004) and on evidence in the literature on LD of frequent comorbidity between language disorders and calculation problems (Geary, 1993, 2004; Geary et al., 1999), the detection of differences between groups on calculation skills

would contribute to better defined profiles of LA FL learners. In fact, their problems may not be limited only to the linguistic area, but may affect other important scholastic areas or may be seen to affect more general behavior, such as the ability to maintain focused attention and to control self-regulation (e.g., Carte et al., 1996; Cornoldi, Gardinale, Pettenò, & Masi, 1996; Elbert, 1993; Gilger et al., 1992; Marzocchi, Lucangeli, De Meo, Fini, & Cornoldi, 2002; Swanson et al., 1999).

## EXPERIMENT 2

In Experiment 2, the relationship between native language reading skills and FL learning difficulties was again explored by comparing two groups of FL learning students on the reading battery tasks (Cornoldi et al., 1995). None of the students who took part in Experiment 1 were examined in Experiment 2. However, the participants in Experiment 2 were selected following criteria identical to those used in Experiment 1, so that a group of LA FL learners and a group of HA FL learners were identified.

To examine the calculation skills of participants, a subtest was adapted from the Italian standardized calculation test (AC-MT; Cornoldi, Lucangeli, & Bellina, 2002). Standardized Italian rating scales to assess attention deficits and self-regulation control were presented to parents and teachers to examine a possible association with the difficulty of learning an FL (Cornoldi et al., 1996; Marzocchi et al., 2002).

## Method

### Participants

One hundred thirty-two students (63 seventh graders and 69 eighth graders; age  $M = 12.9$  years,  $SD = 5.38$  months) attending a public junior high school in Pavia, Italy, participated in the first selection stage of this study. They had started to learn English as their first FL

in second grade, receiving 2 hours of formal English teaching per week.

Participant selection was carried out using criteria identical to those used in Experiment 1. Fifteen participants, 7 seventh-grade and 8 eighth-grade students (11 boys and 4 girls) were selected as LA FL learners. They were matched for age, grade, and level of nonverbal intelligence with a control group of 15 students (11 boys and 4 girls), again selected from the initial sample.

To obtain an independent evaluation of each student's FL proficiency, FL teachers were requested to evaluate their students' FL learning difficulty on a scale from 1 (*no difficulty*) to 4 (*great difficulty*). The groups differed significantly in their teachers' global evaluation in the expected direction,  $t(28) =$

10.80,  $p < .001$ . The groups' mean scores on the selection tests and teachers' evaluations are shown in Table 4. Table 5 shows the frequency of students obtaining each of their L1 and FL teacher's evaluation scores (from 1 to 4).

## Materials and Procedure

**Reading Skills.** The same Italian standardized battery of reading tests, which measures reading comprehension and reading accuracy and speed (Cornoldi et al., 1995), was presented as in Experiment 1.

**Calculation Skills.** An assessment of calculation skills was drawn from the *AC-MT Test* (Cornoldi et al.,

**TABLE 4**  
Experiment 2: Mean Scores and Standard Deviations on Selection Tests and Teacher Evaluations by Group

Test/Evaluation	LA		HA	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Selection				
PMA Spatial Reasoning	26.93	7.31	27.93	6.80
ELT	26.06	4.63	46.33	4.30
Teacher's evaluation				
Global L1 learning	3.06	0.60	1.35	0.48
Global FL learning	3.45	0.51	1.26	0.60

*Note.* PMA = *Primary Mental Aptitude Battery* (Csonka, 1976; Thurstone & Thurstone, 1963/1981); ELT = *English Learning Task* (Palladino & Cornoldi, 2004); LA = low-achieving foreign language learners; HA = high-achieving foreign language learners; L1 = native language (Italian); FL = foreign language (English).

**TABLE 5**  
Experiment 2: Frequency of Teachers' Evaluation Scores on Global Native and Foreign Language Learning Scales

Global learning score	L1		FL	
	LA	HA	LA	HA
No difficulty	0	10	0	12
Little difficulty	2	5	0	2
Some difficulty	10	0	8	1
Great difficulty	3	0	7	0

*Note.* LA = low-achieving foreign language learners; HA = high-achieving foreign language learners; L1 = native language (Italian); FL = foreign language (English).



2002), and the following subtests were administered:

- *Written calculation.* This task aims to examine calculation skills through the application of mathematical procedures and automatisms. Calculation procedures consist of a body of rules established to correctly manipulate numbers and operations to obtain the correct result. Automatism consists of the rapid retrieval of results. The task includes 2 sums, 3 subtractions, 3 multiplications, and 3 divisions. Integers, decimals, and fractions were adopted. One point was assigned for each correct answer, the maximum being 10.
- *Quantity judgment task.* This standardized task is composed of seven pairs of numbers, and the participant is required to decide which of the two numbers in each pair is the largest. Furthermore, a couple of fractions were included. The whole task requires semantic comprehension, which allows individuals to correctly read the numbers. One point was assigned for each correct answer, the maximum being 7.
- *Digit transformation.* Six series of digits, each with its own category position (units, etc.) were presented. Children were asked to put the digits in order so as to adequately rewrite the number. This task aimed to evaluate the processing skills of a number-syntactic structure and the relationship between the digits forming the number. One point was assigned for each correct answer, the maximum being 6.
- *Put in the correct order task.* This exercise is composed of two sections (ordered from the largest to the smallest and vice versa) and evaluates the semantic representation of numbers by comparing different quantities. Children are required to be able to recognize each quantity and compare and order it. Each trial is composed of six series made up of four numbers to be put in order.

One point was assigned for each correct answer, the maximum being 12.

In all exercises, 1 point was assigned for each correct answer. The maximum total score on the whole task was 35. Calculation subtests are standardized measures, showing a test-retest reliability of about .80 and a correlation of about .50 with teacher evaluation.

### Attention and Self-Regulation

**Control.** A scale for the evaluation of lack of attention and self-regulation control (Cornoldi et al., 1996; Marzocchi et al., 2002) was presented to both teachers (SDAI scale) and parents (SDAG scale) to detect the frequency of behaviors assumed to indicate attention and self-regulation problems. Both scales are composed of 18 items; half refer to the detection of a lack of attention (indicated by odd-numbered items), and half refer to difficulties in self-regulation (even-numbered items). According to the Italian norms, an individual with a score of 1.5 per item is considered to have an attention deficit, whereas a participant with a mean score between 1 and 1.5 is considered at risk for attention-deficit/hyperactivity disorder (ADHD; Cornoldi et al., 1996; Marzocchi et al., 2002). SDAI and SDAG scales are standardized measures, showing a test-retest reliability of about .80 and a correlation of about .70 with other scales assessing ADHD.

### Data Analyses

Statistical comparisons were conducted on the dependent measures (reading accuracy, speed, and comprehension; calculation skill; attention and self-regulation control) to test differences between groups, together with a comparison with the clinical classification obtained from Italian norms. In fact, the tests used to assess each measure permit the referral of group performance to classification criteria and standard norms, thus distinguishing between a low and a positive performance.

## Results

To evaluate possible differences in reading skills (reading accuracy, speed, and comprehension) between groups, a MANOVA was carried out on reading speed, accuracy, and comprehension scores. To compare group scores with standard norms, each performance was referred to the classification criteria of the reading battery test (Cornoldi et al., 1995) to distinguish between a poor and a positive performance.

### Accuracy and Speed

As can be seen from Table 6, the results showed significant differences between groups in the second experiment. A between-groups MANOVA was performed on all the reading indices. The LA FL learners were significantly less accurate,  $F(1, 28) = 29.78$ ,  $p < .001$ ,  $\eta^2 = .51$ , and showed a longer reading time,  $F(1, 28) = 6.73$ ,  $p < .05$ ,  $\eta^2 = .19$ , than the HA FL learners. However, a closer look at their average scores compared to the Italian norms and the relative classification showed that both reading speed and accuracy scores were within the positive range for both groups, as can be seen from Table 6.

### Comprehension

As can be seen from Table 6, LA FL learning children obtained on average lower scores than the HA FL learning children on both passages. However, the difference between groups was significant only for the science-based passage,  $F(1, 28) = 15.22$ ,  $p < .001$ ,  $\eta^2 = .36$ .

When the reading comprehension scores for the science-based text were classified, we observed that a high percentage of controls were placed in the positive competence range (85.7% of seventh graders and 87.5% of eighth graders), whereas the percentage of LA FL participants who obtained a positive performance was much lower (12.3% of seventh graders and 25% of eighth graders).

## Calculation

Table 7 shows the group means and standard deviations for each subtest of the calculation battery. An ANOVA was performed with the calculation total score as the dependent variable. The results showed a significant difference between groups in the calculation performance,  $F(1, 28) = 9.90, p < .01, \eta^2 = .26$ .

The total score for the calculation battery was composed of four different scores, each of which represented a specific calculation skill. Therefore, group comparisons on each calculation index were conducted using a MANOVA with group as a between-subjects factor. The comparison between groups in the written calculation subtest only approached significance,  $F(1, 28) = 3.65, p = .07, \eta^2 = .11$ , with the HA group being able to correctly complete two written calculations more than the LA group.

The results showed a significant difference between groups in the digit transformation subtest,  $F(1, 28) = 16.69, p < .001, \eta^2 = .37$ , with LA FL learning children being able to correctly solve less than 3 digit transformations out of 6, whereas the HA group performed almost at ceiling level, with an average of 5.5 correct transformation out of 6. No other difference was statistically significant.

Furthermore, according to the Italian norms (AC-MT; Cornoldi et al., 2002), scores may be classified as positive or negative performances—a negative performance (a score equal or lower than 18) being an index of high risk for LD. The classification of the average calculation score obtained by LA FL learning children fell within the positive range ( $M = 21.40$ ; see Table 7); thus, it could be considered adequate for their age and level of education.

## Attention and Self-Regulation Control

To examine the consistency between parents' and teachers' evaluations, correlation analyses were performed on the total and partial scores for each

scale. The results showed significant positive correlations between parents' and teachers' scores with regards to both the total score,  $r = .52, p < .01$ , and the single scores (lack of attention,  $r = .55, p < .01$ ; lack of self-regulation,  $r = .40, p < .05$ ).

To compare groups on attention versus self-regulation behavior and teachers' versus parents' evaluations, a mixed-design,  $2 \times 2 \times 2$  ANOVA was conducted on evaluation scores with two within-subjects factors—evaluators (parents vs. teachers) and type of behavior (attention vs. self regulation)—and one between-subjects factor (group). The results showed a significant third-level interaction,  $F(1, 28) = 4.63, p < .05$ ,

$\eta^2 = .14$ . Post hoc examination with Tukey's method showed that LA FL learning children were showing a higher score on lack of attention than children in the HA group, which was much higher on the teachers' than on the parents' evaluations,  $p < .05$ . However, the LA group obtained an evaluation on lack of self regulation that was comparable to the HA group from both teachers (LA,  $M = 3.27, SD = 3.08$ ; HA,  $M = 3.47, SD = 6.01$ ) and parents (LA,  $M = 5.13, SD = 4.85$ ; HA,  $M = 4.93, SD = 3.05$ ).

As can be seen in Figure 2, LA FL learning children showed an evaluation score on lack of attention that was quite close to the high-risk level for

**TABLE 6**  
Experiment 2: Mean Scores and Standard Deviations on Reading Proficiency Measures by Group

AL-MT reading skill	LA		HA	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Reading accuracy <sup>a</sup>	2.03	1.27	0.16	0.36
Reading speed <sup>b</sup>	143.81	53.81	105.40	12.46
Reading comprehension				
Narrative	6.80	1.85	8.00	2.20
Science based	5.07	2.00	7.70	1.65

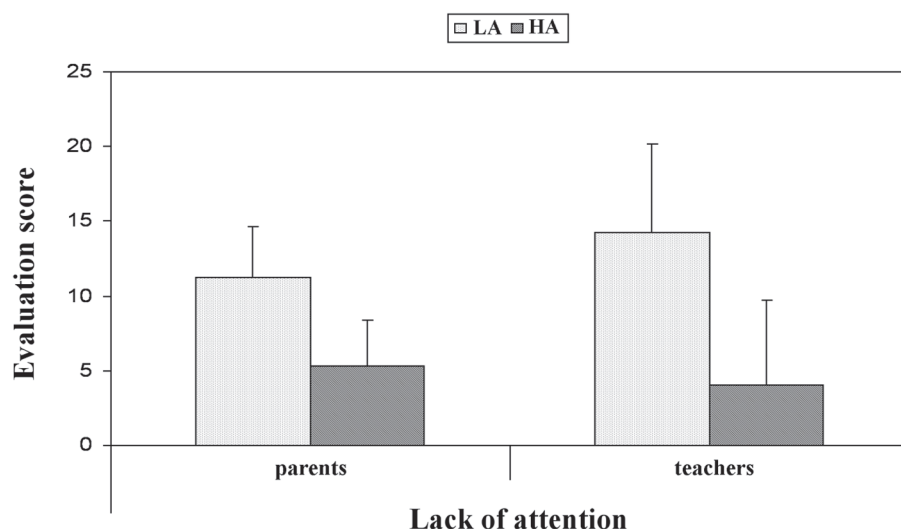
*Note.* LA = low-achieving foreign language learners; HA = high-achieving foreign language learners; AL-MT = *La Verifica dell'Apprendimento della Lettura: Nuove Prove Oggettive MT di Lettura* [Reading Learning Skill Test: New Reading Objective Tasks for Reading Testing] (Cornoldi, Colpo, & Gruppo MT, 1995).

<sup>a</sup>Number of reading errors. <sup>b</sup>Reading time in seconds.

**TABLE 7**  
Experiment 2: Mean Scores and Standard Deviations on Calculation Proficiency Measures by Group

AC-MT calculation subtest	LA		HA	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Put in the correct order	7.46	3.20	8.66	3.57
Written calculation	4.60	2.69	6.63	3.11
Quantity judgment	6.46	0.63	6.66	0.48
Digit transformation	2.86	2.44	5.53	0.63
Total score	21.40	4.00	27.27	5.70

*Note.* LA = low-achieving foreign language learners; HA = high-achieving foreign language learners; AC-MT = *Test AC-MT: Test di Valutazione delle Abilità di Calcolo* [AC-MT Test: Assessment of Calculation Skills] (Cornoldi, Lucangeli, & Bellina, 2002).



**FIGURE 2.** Experiment 2: Group comparisons on lack of attention on parents' and teachers' evaluations by group. LA = low-achieving foreign language learners; HA = high-achieving foreign language learners.

ADHD, particularly when the teachers' evaluation was considered. This indicates that the problem was mainly evident at school, although the parents' evaluation was also above the cutoff point between average and risk level, according to Italian norms (cutoff = 9; Cornoldi et al., 1996).

## GENERAL DISCUSSION AND CONCLUSIONS

The present study was designed to examine Italian children who studied English as a second language for several years with the general aim of increasing the knowledge about FL learning. One goal of the study was to extend the findings obtained by previous research (LCDH; Sparks & Ganschow, 1991; Sparks et al., 1989) to younger children, and a second aim was to evaluate the comorbidity of FL learning difficulties with verbal and nonverbal learning difficulties and its association with behavioral problems. In two experiments, children in seventh and eighth grades who showed low achievement (LA) and high achieve-

ment (HA) in FL learning were compared.

The results from both experiments showed consistent differences between the groups in native language reading comprehension. Furthermore, both experiments consistently showed that average scores obtained by LA FL learners on reading comprehension indicated a risk of LD according to Italian norms, particularly when the results from the science-based text were considered. The results on the narrative text were less reliable between experiments. A possible explanation could be that this text genre is likely to be quite sensitive to experience, and the participants' experience, based on their text sensitivity and metacognitive knowledge (Orasanu, 1986), may have helped them to overcome comprehension difficulties.

However, group differences in reading accuracy and speed were slight and sometimes not even statistically significant. LA FL learning children showed average scores in reading accuracy and a reading speed compatible with the average performance for their age and grade in both experiments. Taken together, the results of

both experiments are consistent in indicating that LA FL learning children have impaired native language reading comprehension, whereas their reading skills are slightly lower when compared to the HA group, but within the average range. Although consistent between experiments, these results are quite surprising because, according to the linguistic coding difference hypothesis (LCDH; Sparks & Ganschow, 1991; Sparks et al., 1989), LA participants should have had native language problems, specifically in tasks requiring phonological-orthographic skills. This seems to be the case for many students with a difficulty in learning a foreign language, as was highlighted by the research of Sparks and colleagues (see, e.g., Sparks et al., 1992a, 1992b). In fact, when high- and low-risk students were compared on phonology, syntax, and semantic measures, differences emerged specifically in the first two areas but not in the latter (Sparks et al., 1992a, 1992b). A possible explanation for the differences between our results and those of the aforementioned studies could be a bias in group selection. The selection of the Italian group with LA in FL learning could have been based on an L2 reading comprehension test. However, this was not the case. Children with low achievement in FL learning were intentionally selected on grammar knowledge and phonological-orthographic skills (Palladino & Cornoldi, 2004). Therefore, the profile of reading comprehension problems without a reading difficulty is even more surprising on the basis of the selection criteria, and it seems likely to be related to the age and grade of our participants and to the fact that they studied English as a second language early in school. Although the difference in participant age between the studies is not large in absolute value, our students were still in a compulsory education process that becomes selective and eventually more professionally oriented only in the ninth grade. The Italian educational system is oriented toward an integration of both more



and less successful children, all of whom are required to complete the compulsory curriculum (Palladino, Cornoldi, Vianello, Scruggs, & Mastropieri, 1999).

A further aim of the study was to test the relationship between FL learning difficulties and other learning problems not directly related to language and verbal skills. LA FL learning children were not at risk for a calculation disability, as they demonstrated an average score compatible with their age and grade following Italian norms. Their performance was always slightly lower than that of the HA group, and in one case (the digit transformation task), the difference was also statistically significant. A possible explanation is that this task has a lot to do with coding and learning of arbitrary system rules and, for these reasons, could have much in common with language learning and reading (McCloskey, 1992).

The analysis of the parents' and teachers' evaluation of the children's behavior indicated that LA FL learning children have trouble controlling their attention, particularly in school, where they show inattentive behavior with such frequency to be considered at risk for ADHD. The fact that this problem was more evident at school could be considered, at least in part, a consequence of learning difficulties. As Ganschow et al. (1998) suggested, the lack of motivational and behavioral control in children with FL learning difficulties could be a consequence rather than a cause of the learning difficulty. However, again, LA FL learning children seemed to have a profile quite different from that of older students with FL learning difficulties. In fact, a recent work by Sparks et al. (2004) showed an absence of comorbidity between FL learning difficulties and ADHD when high school students were tested. The different results obtained in these studies could still be a result of group selection and age, but it should also be noted that the design of Sparks et al.'s (2004) study was reversed, going from

an ADHD profile to a FL learning difficulty detection.

In conclusion, the present study showed that seventh- and eighth-grade Italian students with some difficulty in learning English as a second language did not have significant problems in either reading speed and accuracy or calculation skills. In contrast, they appeared to have a significant reading comprehension problem together with a difficulty in attentional control, particularly when they are at school. To complete the picture, they seem to have an adequate behavioral self-regulation control. Therefore, based on the teachers' evaluation, FL learning difficulties appear to be associated with a reading comprehension difficulty and with a risk for ADHD.

To conclude, difficulty in learning a foreign language seems to have quite a specific profile related to age, grade, and native language. The present study showed that Italian children learning English as a foreign language have some problems in the linguistic domain, although these problems do not overlap with those of older native English-speaking students described in the literature. The results indicate the relevant role played by different variables in defining the nature and characteristics of FL learning difficulties and call for further evidence in order to clarify each specific learning difficulty profile.

#### ABOUT THE AUTHORS

**Paola Palladino**, PhD, is an associate professor of general psychology at the University of Pavia, Italy. Her current interests include learning disabilities and memory. **Marcella Ferrari**, MEd, is a doctoral student at the University of Pavia. Her research interests are in the areas of learning disabilities, foreign language learning, and learning and memory. Address: Paola Palladino, University of Pavia, Department of Psychology, Piazza Botta 6, 27100 Pavia, Italy; e-mail: paola.palladino@unipv.it

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